

<b>Interview Summary</b>	Application No. <b>09/523,820</b>	Applicant(s) <b>Fetcenko et al.</b>
	Examiner <b>Cam Nguyen</b>	Group Art Unit <b>1754</b>

All participants (applicant, applicant's representative, PTO personnel):

(1) Examiner Cam Nguyen (3) Mr. Michael A. Fetcenko (Inventor & Sr. Vice President)  
 (2) Mr. Philip H. Schlazer (Patent Attorney) (4) Mr. Marvin Siskind (Patent Counsel & Vice President)

Date of Interview 2/27/02

Type: a) Telephonic b) Video Conference  
 c) Personal [copy is given to 1) applicant 2) applicant's representative]

Exhibit shown or demonstration conducted: d) Yes e) No. If yes, brief description:

Comparison data & graphs.

Claim(s) discussed: Independent claims

Identification of prior art discussed:

Ward (U.S 4,686,030)

Agreement with respect to the claims f) was reached. g) was not reached. h) N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Invention discussed. Mr. Fetcenko urged the catalyst of the Ward reference is drawn to a nickel oxide as opposed to a metallic nickel on a support. Mr. Fetcenko further urged the particle size of the nickel particles is much larger than the claimed particle size. Examiner agreed with Mr. Fetcenko that the catalyst disclosed by Ward does not contain a metallic nickel. Examiner indicated will consult with an SPE. However, examiner updated the search and found a new reference to Michalko (U.S Pat. 3,972,829), which reference teaches a catalyst containing metallic nickel having a crystallite size of less than 25 Angstroms carried on an alumina support (see Michalko at col. 4, Example 1, ln 14-37, & col. 6, claim 1, ln 15-18).

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) It is not necessary for applicant to provide a separate record of the substance of the interview (if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached

*Cam Nguyen*  
*2/27/02*

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

**TECHNOLOGY CENTER 1700  
COVER SHEET**

DATE: 2/27/02

APPL. NO.

091523,820

TO: Mr. Schlazer

FAX NUMBER: 248-844-2273

PHONE NUMBER: 248-293-0440  
(Ext. # 6260)

FROM: Examiner C. Nguyen

MESSAGE: Interview Summary  
& an attached reference.

NUMBER OF PAGES INCLUDING THIS ONE: 6

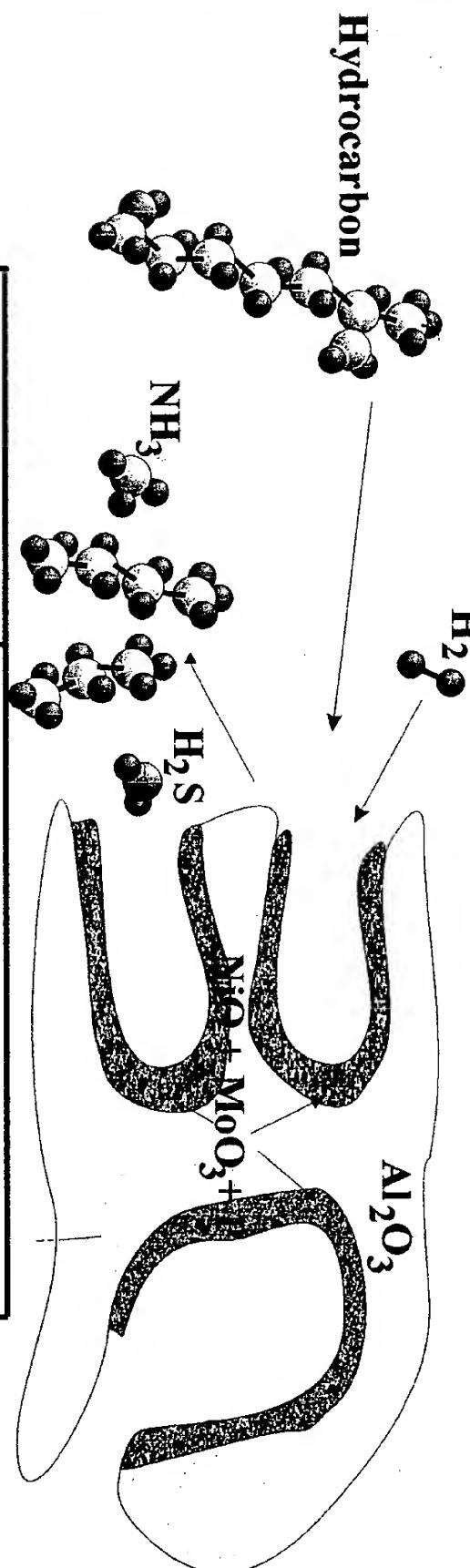
Tech Center 1700 Fax Number 703-305-3599 or Fax Number 703- \_\_\_\_\_  
Tech Center 1700 Phone Number 703-308-0661

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DIFFICULTIES WITH THIS FACSIMILE PLEASE CONTACT  
THIS OFFICE BY USING THE PHONE NUMBER PRINTED ABOVE

THANK YOU

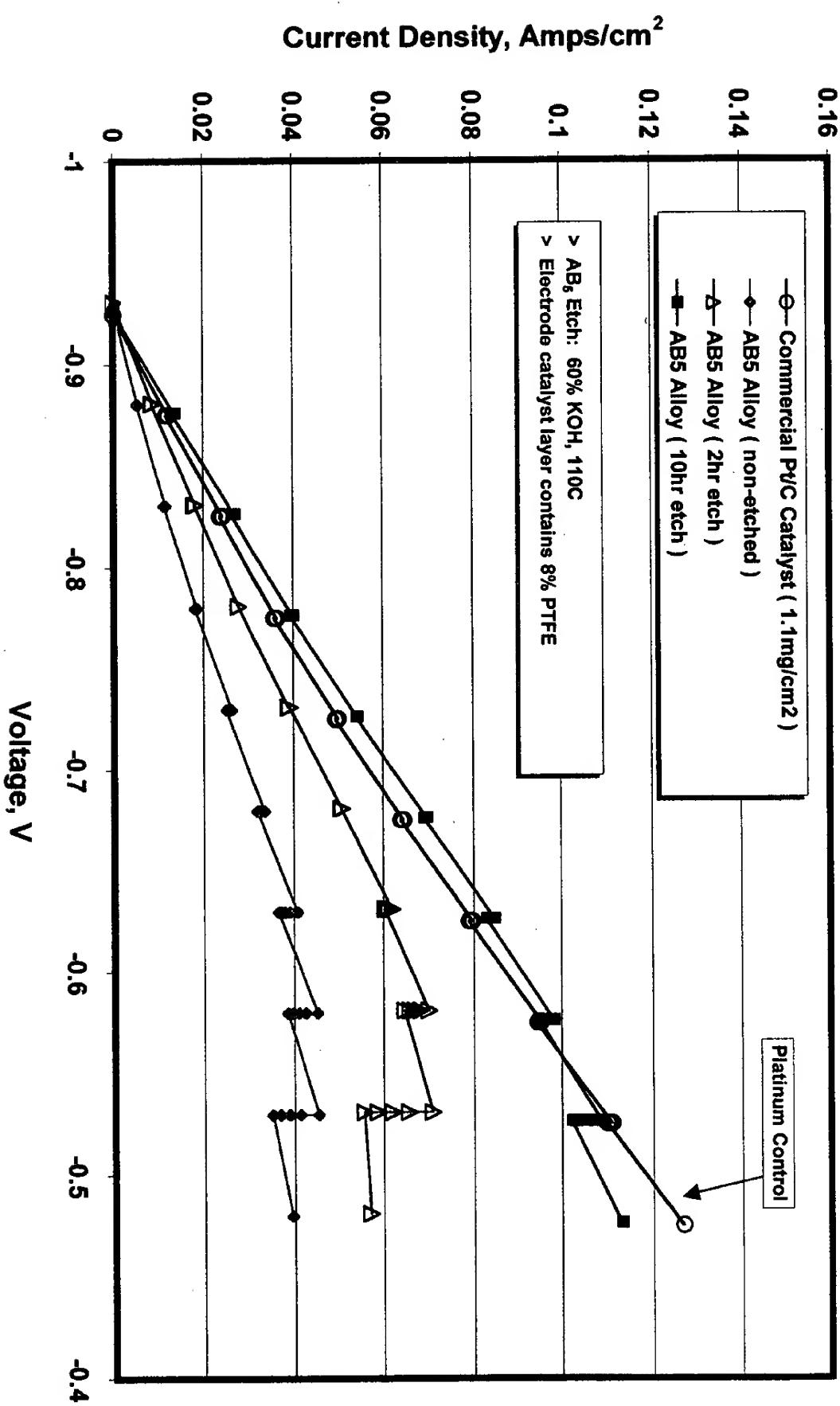
# Mild Hydrocracking Catalysis (Ward, US4,686,030)

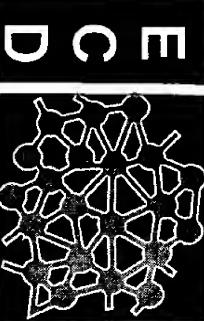
2/27/02



	"Hydrogenation Catalysis" for Mild Hydrocracking (Ward)
Mechanism	To break high molecular weight oil into lighter oil and remove sulfur and nitrogen. Only hydrogen dissociation at high temp. ( $500\text{-}900^{\circ}\text{F}$ ) is required $\text{H}_2 \rightarrow 2\text{H}^+$ (irreversible)
Kinetics	
Catalysis	$\text{NiO}, \text{MoO}_3$ , and $\text{P}$ calcinated inside alumina pores
Preparation	Chemical impregnation of fine pore alumina with <u>Metal Complex</u> (not metallic)
Reversibility	Irreversible
Chemical Reaction	$\text{C-C-C...C-C-C} \xrightarrow{\text{S}} \text{C-C..C} + \text{C-C..C} + \text{H}_2\text{S} + \text{NH}_3$

# Ovonic Catalyst Development





# Ovonic Battery Company

## Crucial Excerpts from Citation US 4,686,030 (Ward, Hydrocracking Catalyst)

- "If the active metal precursors are incorporated by impregnation, a subsequent or second calcination, as for example at temperatures between 750°F and 1400°F, converts the metals to their respective oxide forms. In some cases, calcinations may follow each impregnation of individual active metals". (Column 4, lines 46-51).
- "A subsequent calcinations yields a mild hydrocracking catalyst containing the active metals in their respective oxide forms." (Column 4, lines 60-64).
- "Preferably, the catalyst contains both a Group V1B and VIII element as hydrogenation metals, with cobalt or nickel.....Group V1B metal components, calculated as the trioxide, and from about 0.5 to about 8 weight percent of Group VIII metal components, calculated as the monoxide". (Column 5, lines 1-17).
- "One preferred catalyst employed in the invention contains about 1 to about 6 weight percent of Group VIII metal components, calculated as the monoxide...." (Column 6, lines 21-23).

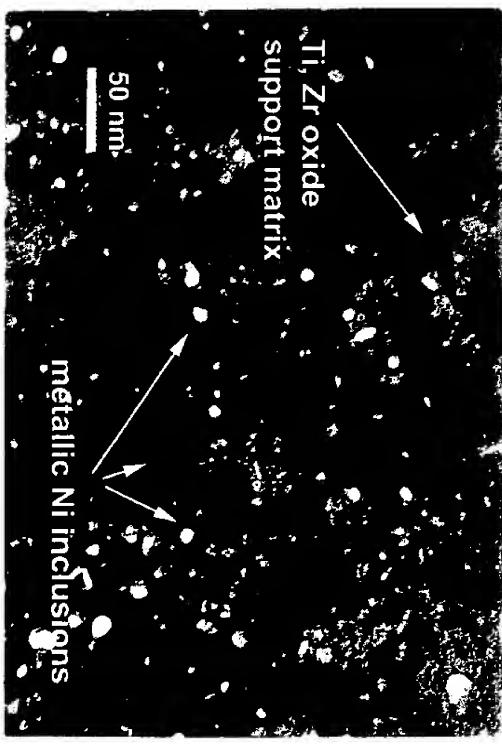
➤ "A highly preferred catalyst employed in the invention contains about 1 to about 6 weight percent of nickel component, calculated as NiO....." (Column 6, lines 35-39).

# Comparison of Ovonic MH catalyst with an industrial ( $\text{Ag}^{2+}$ ) oxidation catalyst

Brightfield images

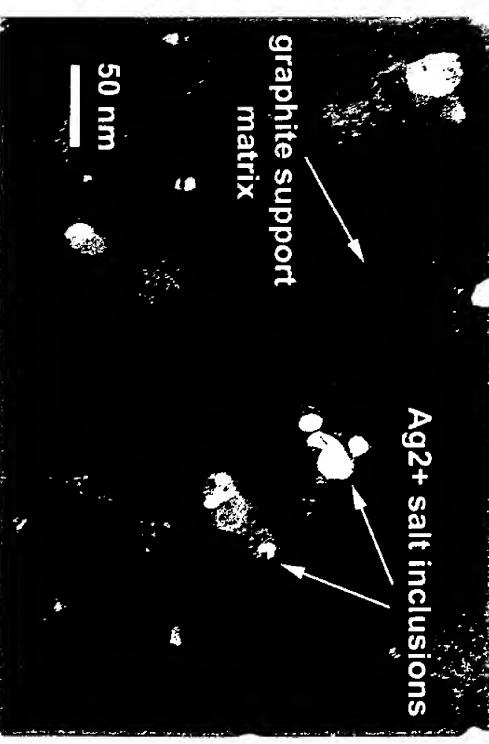
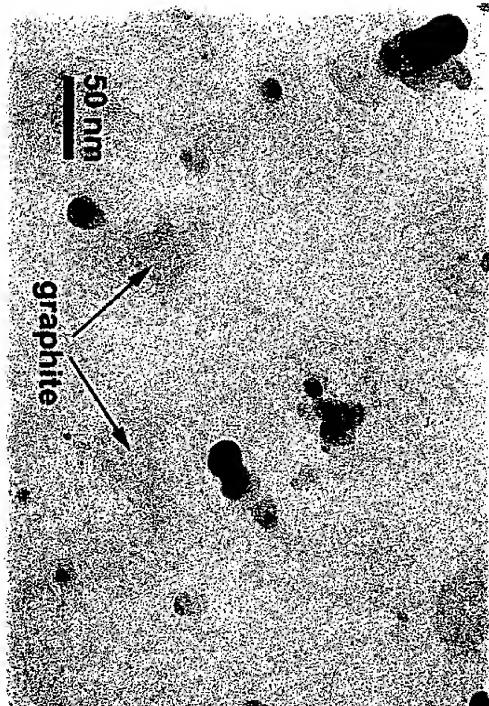


Darkfield images



Ovonic MH catalyst<sup>1</sup>  
(metallic Ni average ~50-70 Å)

Oxidation catalyst<sup>2,3</sup>  
(silver sulfide average ~350 Å)

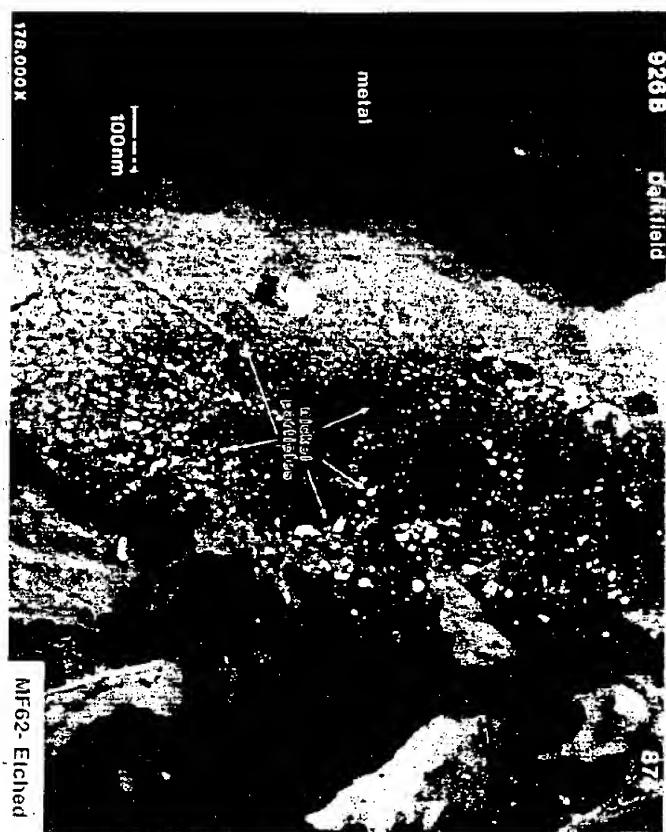


1 M. Fetcenko et al. US Patent 5,536,591 (1996).

2 D. F. Steele et al. "The Low Temperature Destruction of Organic Waste by Electrochemical Oxidation", Trans I. Chem. 68, 115-121 (1990).

3 P. Galvezot et al. "Oxidative dehydrogenation of rosalva to costenol on supported silver catalysts", J. Mol. Catal. A 129, L127-L130 (1998).

TEM Micrograph from  
Etched Electrode



SEM Micrograph from  
Raney Nickel



Average diameter of Ni ~ 50-70 Å

178,000 X

Average diameter of Ni ~ 0.5 μm

$5-7 \times 10^{-9}$  m

$5 \times 10^{-7}$  m